SAN DIEGO WATER BOARD

June 2016

LOWER POLLUTANT CONCENTRATIONS FOUND IN SAN DIEGO RIVER FISH

Are ecosystems healthy

Is it safe to swim

ARE FISH AND SHELLFISH SAFE TO EAT

Is water safe to drink

BIOACCUMULATION HARMS FISH, SHELLFISH, AND HUMANS

Fish and shellfish are nutritious and good for you to eat. But some fish and shellfish may take in toxic chemicals from the water they live in and the food they eat. Some of these chemicals build up in the fish and shellfish - and in the humans that eat fish and shellfish - over time. This process is called bioaccumulation. Monitoring for bioaccumulation helps determine whether fish and shellfish are healthy and safe to eat.

THE SAN DIEGO RIVER IS A PRIORITY

Fishing is common throughout the San Diego River, but its fish are exposed to pollutants from urban, industrial, and rural areas. The San Diego Water Board and partners recently sampled fish tissues from the river to assess current conditions and trends to historic monitoring.

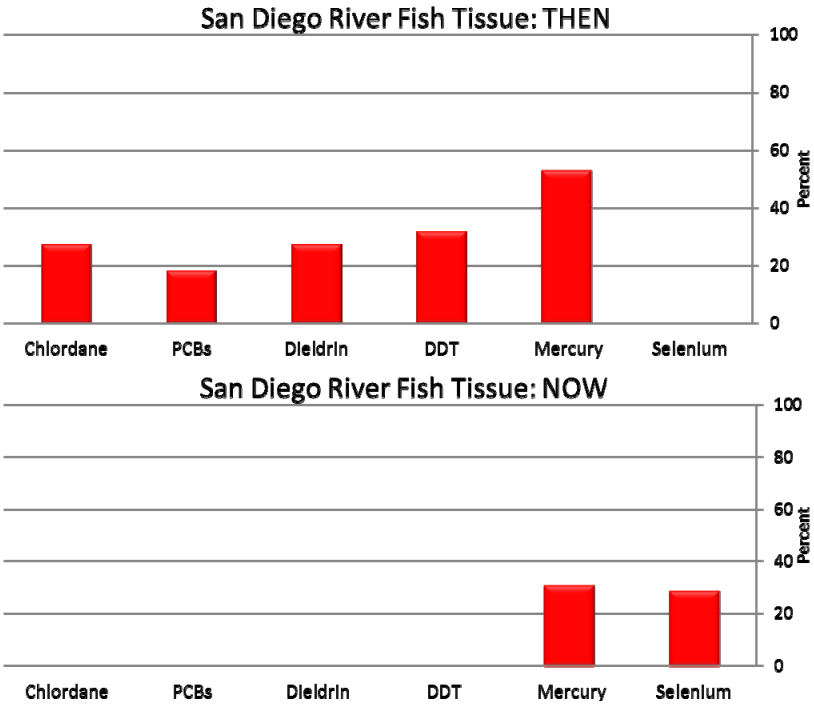

Figure 1. The percentage of tissue samples with concentrations above human health screening criteria has dropped (improved) for all pollutants except selenium.

Sampling bullhead catfish in the San Diego River with the California Department of Fish and Wildlife

CONDITIONS HAVE IMPROVED

Sampling results from 2013-2015 indicate that conditions in the San Diego River have improved (Figure 1). Pollutants such as DDT, PCBs, Chlordane, and Dieldrin were present at elevated levels in surveys from 1979-1999. These pollutants are currently banned from use in California and are no longer being detected or are found at extremely low levels in fish species sampled in the river.

MERCURY IS STILL A PROBLEM

Results show that there is still a cause for concern because of elevated levels of mercury. However, fewer recent samples had high mercury concentrations and those that did were mostly limited to a single species of fish. Selenium was also found to be elevated in some fish from historic sand and gravel mining ponds.

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PROJECT PARTNERS:

SWAMP Surface Water Ambient Monitoring Program

California Department of Fish and Wildlife

California Water Quality Monitoring Council

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MERCURY IS A PROBLEM IN LARGEMOUTH BASS

Largemouth bass had the highest level of mercury in the river, with the largest fish containing the highest levels of mercury. Bluegill, green sunfish, and black crappie had the lowest levels of mercury and thus pose the least risk to eat (Figure 2).

LARGEMOUTH BASS ARE A TOP PREDATOR

Mercury is a toxic, global contaminant that threatens ecosystem and human health. Mercury enters the environment in complex ways, including from atmospheric deposition and historic mining practices. As a top predator, largemouth bass contain the most mercury. This is not surprising because top predators often contain the most pollution due to age, size, and a process called biomagnification.

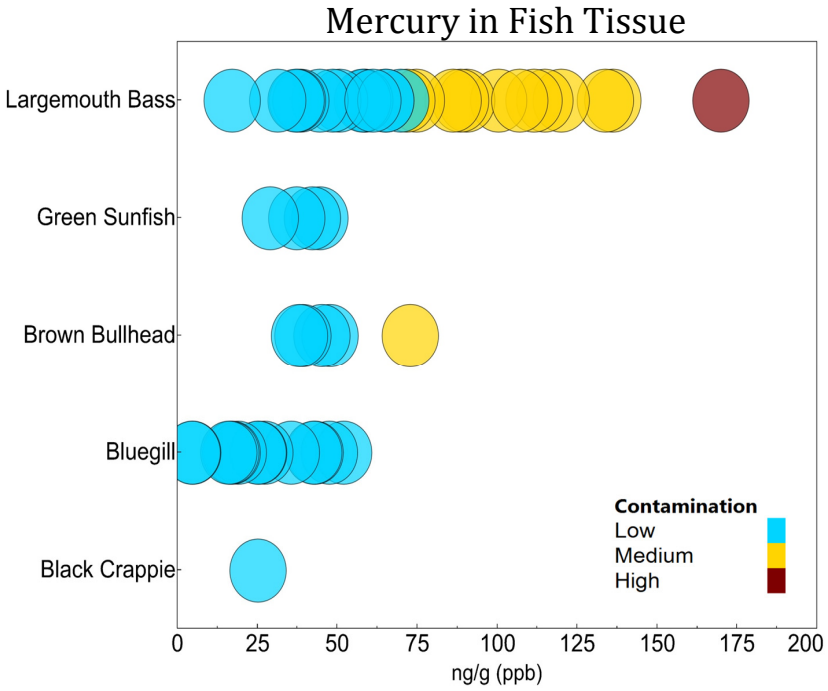

Figure 2. Concentrations of total mercury in individual fish collected from 2013-2015, with relative consumption risk indicated by color.

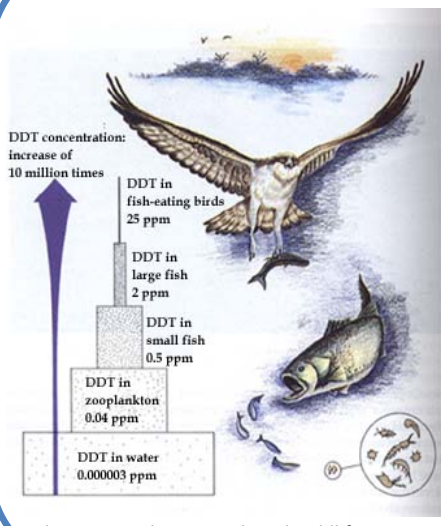

Photo: United States Fish and Wildlife Service

BIOMAGNIFICATION

Biomagnification is the process where tissue concentrations of a contaminant increase as it passes up the food chain through two or more trophic levels. While levels in the lower food web may be minimal, biomagnification can result in high concentrations in larger predator species such as birds and humans.

One example of biomagnification comes from the use of DDT, a synthetic pesticide banned in the United States in 1972. Biomagnification of DDT up the food chain resulted in magnified levels in fish-eating birds, such as the California brown pelican. Many bird populations suffered from liver tumors and failed reproduction due to embryo toxicity and eggshell thinning. For more information, see:http://www.fws.gov/home/feature/2009/pdfbrown_pelicanfactsheet09.pdf

WHAT'S NEXT?

The San Diego Water Board will produce a report in 2016 summarizing the complete sampling results. Additional sampling of the historic mining ponds may occur to confirm the level of health risk associated with selenium. Additional historic data from sites in lower portions of the river may be revisited. Data will be submitted to the State of California Office of Environmental Health Hazard Assessment, the agency responsible for developing formal fish and shellfish consumption advisories and guidelines.

References

Klasing S., Brodberg R. 2008. Development of fish contaminant goals and advisory tissue levels for common contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene. State of California Pesticide and Environmental Toxicology Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency.